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The effectiveness of audio-visual on the teaching and learning mathematics in Adeyemi College of education public primary school, Ondo state, Nigeria

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ABSTRACT

Education (formal or non-formal) is an absolute necessity for everybody. Teaching and learning are the essential element in education. This research investigated the effectiveness of audio-visual in teaching and learning Mathematics in Adeyemi College of Education Public Primary School Ondo, Ondo state. A total number of twenty six (26) primary one students were involved in the experiment, in which 53.8% were male and 46.2% were female approximately. The involved students were also grouped into three in respect to their ages. Data for research analysis were collected through pre-test and post test scores. T-test and Analysis of variance were used to analyze the three hypotheses stated for the research. The findings revealed that there is significant difference between the mean score of the post-test for traditional method of teaching and the audio-visual method of teaching and learning Mathematics. It was also revealed that the students' age has significant influence on their performance when exposed to the audio-visual method of teaching and learning Mathematics. However, there is no significant difference in the mean score of male students and the mean score of female students when exposed to the audio-visual method of teaching. Finally, based on the research findings recommendations were made on the need to develop relevant audio-visual aids for teaching Mathematics in primary schools.

Keywords: Education; teaching; Mathematics; learning; students

1. INTRODUCTION

Mathematics is a discipline that is frequently encountered in association and related to many subject areas such as introductory technology, Basic Science and Agricultural Science. Ronald (2013) reported that people believe that Mathematics is a divine discipline, some love mathematics while some fear it some even worship it. For some years past, the interest of Nigerian students in Mathematics

at all levels of Education has been examined by some researchers. Mathematics as a subject is being perceived by the students in different ways. The fact that government also made it a core subject, many students have developed permanent hatred for the subject. Due to this, very many of them see the subject as a stumbling block on their way to progress academically. A question stands to be answered “ does that mean that enough efforts has not been put in place in respect to this by the government, non-government organizations and various stakeholder of education which can actually help the situation?’. No matter the amount of efforts government or stakeholder of education puts into this case to make sure students developed personal interest in the subject, it will be wasted efforts if method or approach for teaching and learning the subject are not properly addressed. Therefore, the way mathematics is to be introduced to young pupils is very essential because this can influence their attitudes towards Mathematics. Some researchers have found out that positive attitude towards Mathematics leads students towards successes in the subject. As an example Ma and Xu (2004) discovered that attempt to improve attitude towards Mathematics at lower level provides base for higher studies in Mathematics at secondary school level. So method of teaching Mathematics is one of the major factors that can affect the attitude of students towards Mathematics. Usually, the way Mathematics is been taught in the classroom and the way it is perceived by students have a lot to do with their performances. The early stage of Mathematical teaching is important in the sense that the pupils future performance in the subject depend on how well he/she performs at this stage.

Audio-visual improves the way mathematics should be taught and enhances student understanding of the basic concepts. Many researchers have carried out studies to evaluate the benefits of using Audio-visual aids in teaching and learning mathematics. Singh (2005) defined Audio-visual aids as any device which by sight and sound increase the individuals’ practice, outside that attained through read labeled as an audio-visual’. Visual aids are those instructional devices which are used in the classroom to encourage learning and make it easier and motivating. So it means that use of visual aids make teaching learning process more effective. They concretize the information to be obtainable and help in making learning practice appear real, active and vital. They supplement the work of the teacher and help in the research of the text books.

1.1. Purpose of the study

The purpose of the study is to investigate the influence of the Audio-visual approach on the teaching and learning of Mathematics in primary school. It also investigates:

1. The extent of effectiveness of Audio-Visual in teaching and learning of mathematics among the pupils of Adeyemi college of Education public primary school Ondo.
2. If the use of Audio-visual as an instructional material, increase the level of understanding of the pupils in learning Mathematics.
3. the difference in performance of the pupils who are exposed to Audio-Visual method of teaching and learning mathematics and those that are exposed to traditional method of teaching.

1.2. Research questions

This study sought to provide answers to the following questions:

1. Does the use of Audio-visual have any influence on the performance of the primary school pupils in Mathematics?
2. Does the age of the pupils have any influence on their learning through Audio-visual method of teaching?
3. Does the pupils’ gender have any influence on their learning through Audio-visual method of teaching?
4. Does the age of the pupils have any influence on their performance when exposed to Audio-visual method of teaching?
5. Does the pupils’ gender also have any in influence on their performance when exposed to Audio-visual method of teaching?

1.3. Research Hypothesis

1. There is no significant difference between the mean post-test scores for the Audio-Visual and the Traditional method.
2. There is no significant difference between the mean scores of the male and female post-test for the Audio-Visual method of teaching and learning Mathematics in Primary School.
3. There is no significant difference in the performance of the pupils base on their age group when expose to Audio-Visual method of teaching and learning Mathematics in Primary School.

2. RESEARCH METHODOLOGY

2.1. Research Design

The research is an experimental research design of a pre-test and post-test, through which data were collected from the pupils to determine the effectiveness of the adopted method (Audio-Visual approach) in teaching and learning mathematics in Adeyemi college of Education public primary school Ondo.

2.2. Sample

The sample consists of total number of twenty-six (26) pupils which are purposively selected from primary one (1) and primary two (2) class students. The students were grouped base on their ages into three: 4-6 years (11.5%), 7-9 years (30.8%) and 10-12 years (57.7%) both male and female.

2.3. Research Instruments

The research instruments for this study consist of the treatment instrument and the test instrument. The treatment instrument which was an Audio-Visual was projected to teach the lesson topic. The test instrument was a 10 items subjective test drafted from the topic lesson.

2.4. Research Procedure

Experimental group: The students in this group were exposed to Audio-visual method of teaching. A pre-test on the identification and multiplication of numbers was administered to the pupils before the treatment. The teaching-learning process involved use of projector to display lesson topic on slide. Thereafter, a post-test was also administered which contained the same subjective questions but re-arranged. Control group: The control group was exposed to the traditional method of teaching. The students in this group were taught the lesson topic using chalk, chalkboard and charts as instructional materials. Similarly, as in experimental group, a pre-test on the identification and multiplication of numbers was administered to the pupils before the teaching and post-test after the teaching.

3. RESULTS

To test for the hypotheses, the data were analyzed using t-test and ANOVA with the help of statistical package for social sciences (SPSS) version 20 at 0.05 alpha levels. The results are presented based on the research hypotheses.

Analysis on student's personal data

Table 1 Personal data of the selected students

GENDER	MALE	FEMALE		TOTAL
N	14	12		26
Percentage	53.8	46.2		100
AGE GROUP	4-6years	7-9years	10-12years	
N	3	8	15	26
Percentage	11.5	30.8	57.7	100

Table 1 displays personal data of the selected students used in the research and it is clearly revealed that 53.8% of the students were male and 46.2% were female. 11.5% of the students were between age group 4-6years, 30.8% were between age group 7-9years and 57.7% falls between age group 10-12 years.

Hypothesis One

There is no significant difference between the mean post-test scores for the Audio-Visual and the Traditional method. To test this hypothesis, t-test was used to analyze the mean scores. The summary of analysis is given in table 2.

Table 2 Audio-Visual and the Traditional method of Hypothesis One

METHODS	N	MEAN	STD	D.F	T	P-Value	Remarks
Audio-Visual	13	6.62	3.228	24	1.537	0.007	Significant
Traditional	13	4.85	3.028				

The result of the t-test analyses in table 2 showed that there was significant difference between the post-test mean scores of the experimental and control groups at 0.05 level of significant ($t=1.537$, $d.f=24$, $p<0.05$). Hypothesis 1 was therefore, rejected.

This implies that there was a significant difference between the performances of students taught with Audio-visual approach and those taught with traditional approach. Moreover, the mean score of the Students taught with Audio-visual was 6.62 while that of the traditional method was 4.85 which implies that students taught with Audio-visual performed better than those taught without the Audio-visual. Hence, Audio-visual enhances learning of Mathematics.

Hypothesis Two

There is no significant difference between the mean scores of the male and female post-test for the Audio-Visual method of teaching and learning Mathematics in Primary School.

The post-test mean scores of male and female pupils in the experimental group were computed in order to test this hypothesis. The analysis was done using t-test statistics and the results were presented in the table 3.

Table 3 Audio-Visual method of teaching and learning Mathematics in Primary School - Hypothesis Two

METHODS	N	MEAN	STD	D.F	T	P-Value	Remarks
Audio-Visual	14	5.21	3.017	24	0.942	0.356	Not Significant
Traditional	12	6.33	3.025				

Table 3 revealed that there was no significant difference between the mean scores of the male and female pupils in the experimental group at 0.05 level of significance since the probability value is greater than the alpha level. Null hypothesis 2 was therefore accepted. Thus, the performances of male and female pupils taught mathematics with the aids of Audio-visual slides were equally enhanced by both sex. Therefore, the Audio-visual approach of teaching and learning mathematic in primary school was gender friendly and not gender selective.

Hypothesis Three

There is no significant difference in the performance of the pupils base on their age groups when expose to Audio-Visual method of teaching and learning Mathematics in Primary School.

Table 4 Audio-Visual method of teaching and learning Mathematics in Primary School - Hypothesis Three

	Sum of Squares	Df	Mean Square	F	P-value	Remark
Between Groups	52.282	2	26.141	3.439	.049	Significant
Within Groups	174.833	23	7.601			
Total	227.115	25				

From Table 4, the calculated F-value of 3.439 was not significant at the 0.05 level. This indicates that there is statically significant difference among the performance of students with their age group 4-6 years, 7-9 years and 10-12 years when exposed to Audio-Visual teaching approach ($F=3.439$, $df=23$, $p=0.049$). Hence, the null hypothesis was rejected. Therefore, there is significant difference in the performance of the pupils base on their age groups when exposed to Audio-Visual method of teaching and learning Mathematics in Primary School.

4. DISCUSSION

The results of hypothesis one reveals that there is a significant difference between the mean post-test scores for the Audio-Visual approach and the Traditional method of teaching which implies that using Audio-visual approach of teaching better the performance of the pupils in Mathematics. These results agree with Shri Krishna (2014) who reported that in the presence of Audio-visual aids the attention is attracted, interest roused and suitable atmosphere for proper understanding is created which can automatically affect their performance in the subject. The finding in table 3 revealed that there is no significant difference between the mean scores of the male and female post-test for the Audio-Visual method of teaching and learning Mathematics in Primary School. This implies that gender of the pupils has no influence on their performance in learning Mathematics through the audio-visual approach of teaching. It was finally observed from table 4 that there is significant difference in the performance of the pupils base on their age groups when expose to Audio-Visual method of teaching and learning Mathematics in Primary School. Thus, base on this result it implies that the age of the pupils may influence their performance when exposed to audio-visual approach of teaching.

5. CONCLUSION

From this research work and based on its findings the following conclusions were drawn:

1. Teachers' instructional strategies employ for teaching basic Mathematics topics with the beginners in primary school have significant effects on the pupils' interest and their achievements in the subject.
2. Since, the male and female students were affected positively and equally by the use of Audio-visual approach of teaching Mathematics then the effect of audio-visual method of teaching is gender independents
3. From the findings, revealed in this study, the age of the learners may be put into consideration when adopting the audio-visual approach of teaching and learning Mathematics.

Recommendations

From the findings of this study, the following recommendations are made:

1. Curriculum planners should encourage the use of Audio-Visual aids in teaching and learning mathematics in primary schools.
2. In-service training should be given to teachers on the appropriate use of Audio-Visual aids approach in teaching and learning mathematics in primary schools.
3. Government and the school authority should equip Audio-Visual facilities in Classrooms for teaching and learning mathematics in primary schools.
4. Age is an important factor to consider in child placement into classes.

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Conflicts of interests

The authors declare that there are no conflicts of interests.

Data and materials availability

All data associated with this study are present in the paper.

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